

What is claimed is:

1. A method for attaching a fan to a rotor assembly for an alternator, said method comprising the steps of:

5 providing a shaft for mounting within a housing of said alternator, wherein said shaft includes an integral shoulder portion for creating an abutment surface;

mounting a fan on said shaft including a fan base and a plurality of fan blades protruding from said fan base, wherein said fan base includes a central bore, and wherein an inner circumference of said fan base along said central bore is juxtaposed to said abutment surface; and

10 mounting a pair of pole cores axially along said shaft toward said shoulder portion to clamp said fan base between a respective end of said pole cores and said abutment surface.

15 2. The method of claim 1 wherein said fan is initially formed with a conical shape elevating said inner bore with respect to an outer circumference, a first side surface of said fan being in contact with said shoulder portion and a second side surface of said fan being in contact with said respective end, wherein said second side surface of said outer circumference is urged against said respective end so as to reduce 20 rotation with respect to said shaft and to increase heat transfer between said first fan and said respective end.

3. The method of claim 1 wherein said shaft includes knurls extending to said shoulder so as to press-fit said cooling fan onto shaft.

25 4. The method of claim 1 wherein said fan includes a drawn down center portion on said inner circumference extending axially along said shaft toward said respective end and said respective end includes a recess on an inner circumference of said respective end.

30 5. A rotor assembly for a dynamo-electric machine comprising:

a shaft generally having a first diameter, said shaft extending axially and being rotatable within said machine, wherein said shaft includes an integrally formed

shoulder portion creating an abutment, said shoulder portion having a cross section larger than said first diameter;

a pole core assembly having a pair of pole pieces encasing a field coil to generate a magnetic field, said pole core assembly secured to said shaft; and

5 a fan for rotating with said shaft having a mounting bore smaller than said cross section of said shoulder portion, said fan being clamped between said shoulder portion and a respective end of said pole core assembly.

6. The rotor assembly of claim 5 wherein said fan is initially formed with a  
10 conical shape elevating said mounting bore with respect to an outer circumference of said fan, a first side surface of said fan being in contact with said shoulder portion and a second side surface of said fan being in contact with said respective end, wherein said second side surface of said outer circumference is urged against said respective end so as to reduce rotation with respect to said shaft and to increase heat transfer  
15 between said fan and said respective end.

7. The rotor assembly of claim 5 wherein said shaft includes axial knurls extending to said shoulder portion so as to press-fit said fan onto said shaft.

20 8. The rotor assembly of claim 5 wherein said fan includes a drawn-down center portion proximate to said mounting bore and extending axially along said shaft toward said respective end, and wherein said respective end includes a recess in a respective pole piece to receive said drawn-down center portion.

25 9. The rotor assembly of claim 8 wherein said recess in said respective pole piece receives said shoulder portion.

10. The rotor assembly of claim 5 wherein said respective end includes a  
pole core shoulder portion on a respective pole piece, and wherein said fan includes a  
30 drawn-up center portion proximate to said mounting bore and extending axially along said shaft away from said respective end to receive said pole core shoulder portion.

11. The rotor assembly of claim 5 wherein said shaft includes at least one recess groove to allow at least one lead coil wire to pass from an electrode to said rotor assembly.

5        12. An alternator assembly including an alternator housing comprising:  
a shaft generally having a first diameter, said shaft extending axially and being rotatable within said alternator housing, wherein said shaft includes an integrally formed shoulder portion creating an abutment, said shoulder portion having cross section larger than said first diameter;

10        a stator including a cylindrical laminated core positioned in said alternator housing having a winding carried by a stator core to generate an electric alternating current;

15        a pole core assembly having a pair of pole pieces encasing a field coil to generate a magnetic field, said pole core assembly secured to said shaft; and  
a fan for rotating with said shaft having a mounting bore smaller than said cross section of said shoulder portion, said fan being clamped between said shoulder portion and a respective end of said pole core assembly.